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REVIEWS

The Geology of the Glasgow District. By C. T. Clough, L. W. Hinxman, J. S. Grant Wilson, C. B. Crampton, W. B. Wright, E. B. Bailey, E. M. Anderson, R. G. Carruthers, with contributions by G. W. Grabham, J. S. Flett, and a chapter on the paleontology by G. W. Lee. Memoirs Geol. Survey Scotland, 1911. Pp. 270; figs. 33; pl. 1.

Sandstones and basalts are the representatives of the Old Red Sandstone period. Associated with the Lower Carboniferous limestones and sandstones are extrusives of basalt, mugearite, and tuffs and intrusives of basalt, dolerite, trachyte, felsite, trachyandesite, trachydolerite, and basaltic and trachytic tuff in vents. In Upper Carboniferous times sedimentation was predominant, although some basic sills and plugs are possibly of this age. In the Permo-Carboniferous there were intrusions of quartz dolerite sills. During the Tertiary, dikes of olivine dolerite were intruded. The Pleistocene and Recent are represented by glacial deposits, old beaches, river terraces, and flood plains.

Coal is the principal economic material and occurs in both the Upper and Lower Carboniferous. Iron carbonate and fire clays are also exploited. Many analyses of limestone are given.

A. E. F.

The Geology of East Lothian. 2d ed. By C. T. Clough, G. Barrow, C. B. Crampton, H. B. Maufe, E. B. Bailey and E. M. Anderson, with contributions by B. N. Peach and John Horne. Memoirs Geol. Survey Scotland, 1910. Pp. 226; figs. 11; pls. 12.

This educational handbook to the geology of the region discusses the formations and their faunas, and describes the associated igneous rocks. The Silurian period is represented by shales, greywackes, grits, conglomerates, and cherts. Two small granite masses, older than the Old Red Sandstone, intrude these formations. The rocks of the Lower Old Red Sandstone period consist of bosses and laccoliths of granite, porphyry, etc., and dikes of porphyrite, felsite, and lamprophyre. The

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upper division of this system is represented by conglomerates, sandstones, and marls. The Early Carboniferous rocks are the Calciferous sandstone series with associated extrusives of basalt, trachydolerite, trachyte, tuffs, and ashy conglomerates and intrusives of essexite, teschenite, and analcite dolerite, monchiquite and analcite basalt. Following the Calciferous is the Carboniferous limestone series, in the middle of which is the Edge coal group, the most important strata from an economic point of view in the district. The Upper Carboniferous is represented by the Millstone grit, which is followed by but a slight representation of the true coal measures. At the close of the Paleozoic, dikes and sills of dolerite were intruded. During the Pleistocene, glaciation affected the entire region.

The petrology of the igneous rocks is thoroughly discussed, and numerous analyses are given. The economics of the area consist largely of non-metallics, of which coal is the principal product.

A. E. F.

Annual Administrative Report of the State Geologist for the Year 1910. By HENRY B. KÜMMEL.

Report on the Approximate Cost of a Canal between Bay Head and the Shrewsbury River. By Henry B. Kümmel.

The Flora of the Raritan Formation. By Edward W. Berry.

A Description of the Fossil Fish Remains of the Cretaceous, Eocene and Miocene Formations of New Jersey. By Henry W. Fowler.

The Mineral Industry of New Jersey for 1910. By Henry B. Kümmel and S. Percy Jones.

Geological Survey of New Jersey, Bulletins 1-5, 1911.

- 1. This bulletin recounts the operations of the Survey. A list of all publications of the present Survey is appended.
- 2. The sea-level canal upon which estimates were made is to be sixty feet wide with a minimum depth of six feet. Its length is 21.76 miles, a portion of which is along present waterways, and whatever excavating will have to be done will be in unconsolidated material. The estimated cost for the right of way, excavation, bridges, and disposal of material is between \$2,152,404 and \$2,784,887.
- 3. The Raritan formation is the oldest non-marine Cretaceous sediment known along the Atlantic. The paleobotanical evidence